The Fort Carson "Green" Building serves as a training facility with a capacity of up to 70 people.

2003
Fort Carson
Green Building
Project

INTRODUCTION

Fort Carson and the Piñon Canyon Maneuver Site (PCMS) comprise 373,300 acres and serve as major military training facilities for the 7th Infantry Division, 3rd Armored Cavalry Regiment, the 10th Special Forces Group, the 43rd Area Support Group and the 3rd Brigade, 4th Infantry Division. Fort Carson's extensive training facilities include 67 ranges, 56 training areas, Butts Army Airfield, 12 drop zones and the 235,896-acre PCMS, located in southern Colorado.

Fort Carson's served population during 2002 included: more than 14,457 active duty military, 2,948 Department of the Army civilians/ Nonappropriated Fund employees and 29,805 family members.

BACKGROUND

The development of more energy efficient, and thereby environmentally friendly, facilities is becoming a growing focus for the government and private industry. Fort Carson is at the forefront of most installations in that it opened doors to a new sustainable training facility in November 2002.

Sustainable design means incorporating such elements as increased energy efficiency; using renewable, cleaner energy sources (solar, wind, geothermal, etc.); constructing with recycled materials; and designing facilities that take advantage of the natural environment.

The Directorate of Environmental Compliance and Management (DECAM) overcame misconceptions, obtained funding and began convincing leadership of the need to begin planning and designing a facility integrated with sustainable elements. This facility is a first step in demonstrating sustainable concepts and how they can be integrated into future construction projects and renovations.

A "Green" building team was formed in 2001 to set the standards and ensure the success of integrating sustainable concepts into a Fort Carson training facility funded for construction in 2002. The project provided an opportunity for the installation and U.S. Army Forces Command (FORSCOM) to implement their desire for such a facility and to test the Army's Sustainable Project Rating Tool (SPiRiT) on a local level.

Agencies involved in the construction of the post's first "Green Building" included: DECAM, the Directorate of Public Works (DPW), the Directorate of Contracting (DOC), FORSCOM and the U.S. Army Corps of Engineers, Omaha District.

A building was developed from the ground up with a limited budget of ***$560,000***. The project demonstrates sustainable concepts, how easy sustainable modifications are to implement and how comparable costs are to a traditionally constructed facility of equal design.

The new sustainable training facility is 2,800 square feet, and includes a training room that can hold up to 70 occupants, a state-of-the-art audiovisual system, two restrooms, a lobby, storage area and a small office. Sustainable elements were incorporated into all facets of the building, including its design, energy efficient features, recycled-content construction materials and interior furnishings.

ARMY SPiRiT PROGRAM

To promote and capture how "green" a facility is, the Army adopted the SPiRiT program. This program assigns points for meeting certain goals in different areas, such as energy efficiency, air quality and water efficiency. The Army goal is for every facility to meet at minimum a bronze standard. The program provides a good self-evaluation tool on how "green" a facility is, however, for Fort Carson's low budget project, it was not cost effective to have it officially certified. Through interpretation of the points, Fort Carson determined the facility earned 48 points or the Silver standard. The point levels of the SPiRiT program are:

Bronze: (25-34)
Silver: (35-49)
Gold: (50-74)
Platinum: (75-100)

OUTSTANDING PROJECT FEATURES

During the design of the building, many features were evaluated for cost and applicability. Some of the elements and equipment integrated into the design and construction included:

The facility maximizes the use of natural lighting to reduce energy costs.

Energy efficient elements:

- ✓ Building orientation takes advantage of southern and western exposure. Some estimates show that proper orientation alone can save a building up to 30 percent in heating, cooling and lighting costs.
- ✓ Energy Star (an Environmental Protection Agency energy efficiency program) high-efficiency, low emissivity windows are equipped with a coating to allow visible light through but selectively block infrared radiation (heat). That means heat has a harder time escaping on cold days and entering on hot days, which boosts insulation efficiency
- ✓ Natural cooling cupola that uses louvers and fans to force hot air up and out eliminating the need for air conditioning.
- ✓ Insulation exceeding local standards. Over R-30 roof value and R-20 exterior wall value.
- ✓ Low hot water demand allows for usage of electric instantaneous water heaters for all sinks. There was no need for a hot water heater or associated piping during construction of the facility.
- ✓ An extremely efficient Energy Star two-stage natural gas furnace.
- ✓ Energy Star compliant Light Emitting Diode (LED) exit signs.
- ✓ Exterior security light triggered by photovoltaic cell.
- ✓ Motion sensors shut off lighting in unoccupied areas such as the office.

Low water usage:

- ✓ Low flow toilets use less than 1.6 gallons per flush and urinals use less than 1 gallon per flush.
- ✓ Metered faucets reduce water usage.
- ✓ Completed a xeriscaping plan to use little or no water.

Improved Air Quality:

- ✓ Interior paint contains no solvents or VOCs (volatile organic compounds).
- ✓ Sub slab vent system captures and releases potentially harmful gases such as radon.
- ✓ Interior doors are not stained, which eliminates unnecessary chemical usage and emissions.

Recycled Construction Materials:

Most of the construction products contain significant percentages of recycled content materials or re-use waste products.

- ✓ Toilet partitions are 80 to 90 percent recycled steel.
- ✓ Concrete foundation and slab contains 20 percent fly ash (waste product from coal combustion).
- ✓ Parking lot made from five percent recycled content asphalt and 100 percent recycled content plastic parking stops.
- ✓ Ceiling tiles are 50 to 79 percent recycled content (made from phone books).
- ✓ Sustainably harvested Oriented Strand Board (OSB) was used as roof sheathing.

Reuse of Materials:

Some of the construction items and office products were obtained from Fort Carson demolition or renovation projects.

- ➢ Handrails and paper towel dispenser in bathrooms taken from demolished facility.
- ➢ Some of the student chairs were obtained from Defense Reutilization and Marketing Office (DRMO) an organization that takes in used government office furniture and equipment and holds public auctions to sell the items.

Furniture and equipment:

Many of the items are either energy efficient or made from recycled materials.

- ✓ Picnic tables are 100 percent recycled content plastic.
- ✓ Computer equipment is Energy Star compliant meaning the EPA has designated as energy efficient.
- ✓ Bike rack is made from 30 to 100 percent recycled steel.
- ✓ Solar walkway lights do not use any electrical grid power.

Recycled content materials were used in construction.

Recycled steel was used in several applications.

Cupola provides natural air conditioning.

Energy efficient windows lower heating/cooling costs.

PROJECT FOLLOW UP

The DECAM and Fort Carson use the facility for environmental training classes it conducts for and soldiers. Future follow up for the facility includes tracking energy conservation savings through the sustainable features of the building and writing up results for planning other green buildings on Fort Carson.